Menlo Park Notebook #186 [N-80-12-24.1]

This notebook covers the period December 1880-February 1881. Most of the entries are by Francis Jehl. The notes, calculations, and drawings relate to special filament arrangements and to chemically treated and platinized carbons. There are also a few cross references by John Lawson to his experiments in Menlo Park Notebook #168. The label on the front cover is marked "Experimental Lamps (Special)," "1880," and "Francis Jehl." The book contains 284 numbered pages.

Blank pages not filmed: 274-277.

195
3390
130

LIBRARY OF THE

BOARD OF PATENT CONTROL,

120 BROADWAY, NEW YORK.

From Library
GENERAL ELECTRIC
44 Broad St. N.Y.

May 1, 1896

1 1

Rang with Cooke

E 177
18840
3500
48 e

177
3 354
118

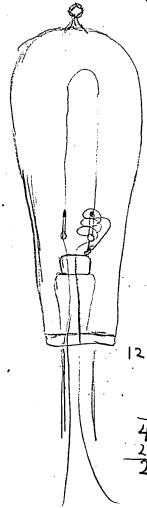
18840
3500
2 22340
111

178 : 13 0 : 111 :

2.1139434
2.0453230
4.1592664
2.0718520
2.0873844

122R
111
11

2



E. 182

R 188 40
50 00
223 840

C 48 119

.182
3 | 364
121

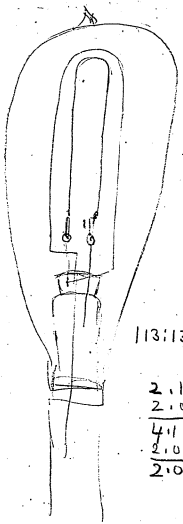
8 ohms

121 :: 130 :: 119

127.8
119
8 ohms

2.113 94 34
2.075 54 70
4.189 49 04
2.082 78 54
2.106 70 50

3



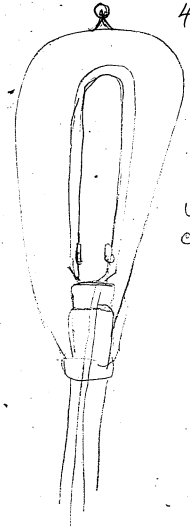
6.170
3340
113
18840
2200
21040
105
48 C

15 ohms

113:130::105

120
105
15

2.11394434
2.02118593
4.13513027
2.05307184
2.08205543

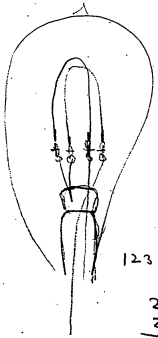


E 195
3990
130
R 18843
3000
48

Very blue at the clamp.

OK

5



E 184

R 18840
4 (7) (1)
2 233 40

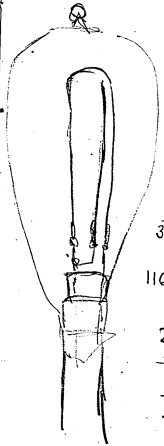
C 48

184
2
3 368
123

123 : 130 :: 116

128.
116
12 Ans

2.1139434
2.0644580
4.1784014
2.0899051
2.1084963



E 175

R 1840
2700
2215 40
107
48

175
3 350
116

116 : 120 : 107

119
7
12

2.1139434
2.0298338
4.1433272
2.0644580
2.0788692

1/4/81 7

Treated with Petroleum

R 316.

E 182

25127

3500

286627

143

48 e

182

3 364

121 v

10 ohms

121 : 150 :: 143

2.1139484

2.1553360

4.2692794

2.0827854

2.1864940

153.

143

10

1/4/81 γ

Treated with P bromide

R. 435

E. 202

31400

43000 R

48C

202

2

364

131

Lookyh

OK

9

treated with Petroleum

R 250

E.182 = 121 10 ohms

R 25127
1500
226627
C 48133

121:120.133

2.1139434
2.1238576
4.2377950
2.0827854
2.1550096

1.43
133
10

Plattnizel 10 Loop

E 205

R 31406
2500
33906

to high

C 48 ~~12~~

thing

169 ohm

1410
136

130

169.

11

Treated with Petroleum

R 335

E. 187

25727
2700 R
27427
C48 139

187
2
3 374
.124

Johns

124 : 130 : 139

2.1139434
2.1430148
4.2569582
2.0934217
2.1635365

146
139
7

1, treated with Carbolic 12
2 acid. R. 190-256
lancet.

E. 98

6227 | R
5800

24 C.

13
Treated with Carbolic acid

R 190-256

E101

R 6277
8 200

24 C

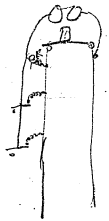
14 Carbolic Acid. 1

190 -- 256

E. 94

627 9 | R
520-01

C24



11 15 Carbolic Acid

194

E.97

.6279
6308 | R

C 48

16

Phosphorus. marked

106 U no 3

C 180

3|360
120 U
104 R

18840
20000

2|20840
C48 104 R

8 hours

120 : 130 : 104

112
104
08

2.11394434
2.01703333
7.92081888
2.05179555

17

Phosphorus.

185

3|370
126 U
124 R

18840
6000

2|24840
C48 124.

20 hours

126 : 130 : 124

2.11394434
2.09342217
7.89996295
2.10599946

127
124
3

18

Chr. Carbon

Second test

128 — 121

12670
800
13360
48

125
121
2 | 249
124
3 | 248
83 U

3 ohms — 66 ohms

~~83:130:66~~

103
68
37

~~2.113 9434~~
1.819 5439
8.080 9219
2.014 4092

19

Sodium

189 — Blue at Lamp

18840
4500
C48

189
3 | 378
126 U
116 R

~~2 | 163440~~

3 ohms.

18840
4500
2 | 23340
116

126:130:116

2.113 9434
2.064 4580
7.899 6295
2.078 0309

119
16
3

20

Naphthalene:

149.5
15840
1000
2 | 19.840
99

48C

149
3 | 1298
990
99R

31 ohms

2.1139434
1.9956352
8.0043648
2.1139434

130
99
31

21

Benzoin

141
12560
5600
C48 2 | 48160
90

94:130 : 90

141
3 | 282
945
90R

30 ohm

124
94
30

2.1139434
1.9542425
8.0268721
2.0950580 = 124

C 99	99	1
R	99	1

22

Benzoin

133

12560
100

12660

C48

3)256
89.7 U
63. R
28 ohms

89.7 : 130 : 63

91.3
63
28

2.1139434
1.7995405
8.0472076

1.9604915

3.9132839
1.9527924

1.9604915

23

Sodium

185

18840
7000

25840

C48

185
2

3)370

123 U
129 R

7 ohms

123 : 130 :: 129

2.1139434
2.1105897
7.9100949

2.1346280

136
129

7

24

Naphthaline

165 — 111.34 V
188 40 — 112 R
36 00 — 19 ohms
C48 — 22440

111 : 120 :: 112

2.113 9434
2.049 21 80
7.954 6760
2.117 8374

131.
12
19

25

Extremely high vacuum on pump.

175 — 1350
188 40 — 116 V
36 00 — 112. Res
C48 — 22440 — 13 ohms

116 : 120 :: 112

2.113 9434
2.049 21 80
7.935 5410
2.098 7024

125.
12
13

26

Ex. high on pump

171 –

18840
2800

C48 216840 108

3342
1145
108 Ros
150 ohs

114 : 130 : 108 150 ohms.

2.1139434
2.0334238
4.1473672
2.0569049
2.0904523

123
108
15

27

R poor vacuum Condenser

195

~~Blank~~

3390

1305
139 Ros

25127
2700
C48 27427

OK

2.1139434

28

Bamboo 8/17 taper end

162 110.7 U
97. Rs

188 40
700

19540 17 ohms

48

110:130::97:

2.1139434
1.9867717
7.9586073

2.0593224
5.1007151
2.0413927

3.0593224

114
97
17

Bamboo 10/17 29 shows very gradually

356

E192

25127
2500

27627

124.6 U
138. R

C48

130

OK.

30

Bamboo 8/14 [illegible] ends 267
P. 127

E194

18840 130.9 v
2100 104 ohms
20940

C48

OK

31

Bamboo 8/14 .035 1 heck .261
.06215 on the ends

E 183.5 124.8 v
R 18840 129 ohms
7100
25940 5 ohms

48 C

125 : 130 : 129

2.1139434
2.1105897
7.9030890
2.1276221

134
29
5

32

Bambo .008 inch
taper from 19/1000 to 15/1000 No 24-9

E 1.82.

R 18840.
5000.

2 23840 1235
119 119R
C48. 6 ohms

123:120::119

2.1139434
2.0755470
7.9100949

2.0995853 125
19
6

33

Bambo 10/17 very gradually .875

E 185

R 18840 124.875
7000 129 ohms
25840 5 ohms

C 48

125:120::129

2.1139434
2.1105897
7.9030890

2.1276221

134
129
5

34

Paper: 9/17 781

New bed Carrow

The Parsonage N.G

Rambo .85 Crook .062.5 m.w
ends. R.61.

180 E. 121.5 U
130 R

18840
7200
26040

Johns

4.8

122:130 : 130

2.1139.434
2

4.2278868
2.0863998

2.1414870 138

36

Bambo 8/17 5 hours regular. 535

185,

18840
8200
2270400
135
48 @

31370
1230

8 ohms

123:135
123:130::135

143
135
08

2.1139434
2.1300338
7.9100949
2.7543721

179
35
34

37

Bambo 8/17 paper on corrosion and clipped after said .358

192
25127
4300
29427

192
0384
128

2 ohms

48 @

128:130::147.

2.1139434
2.1673173
7.8927890
2.1740497

149.
147
2

38

Regular Clamped by deposit Dec 24 1880.

E 145. 3|290 20
97 v
66 ohms
23 ohms

1.5
104.5
53

1 2570
700
2|13260
66 ohms.

48 C

97:130:66

89
66
23

6279
4500
2|10779

2.1139434
1.8195439
8.0132283
1.9467156
3.9334973
1.9467156
1.9867717
53.

53 ohms

Edison Exhibit No 7
June 10 1885
Ellis
Notary Public

39

Regular Clamped by deposit

175
18840
2000
2|20840
104

175
2
3|350
116 v

12 ohms

C48

116:130:104

116
104
12

2.1139434
2.0170333
7.9355410
2.0665177

2.1139434
1.7742759
7.9829667
1.8211860

Edison Exhibit No 7
June 10 1885
Ellis
Notary Public

40 on plate 2

Ex. High on point.

lot a burner with ohms

No 15 1000

114.75 volts

18840
3500
2122340
111. ohms 14 ohms

48 C

115 : 130 :: 111 : X+111

2.1139434
2.0453230
7.9393022 125
2.0985686 14

41

No P burner with ohms
97.50 on plate

116.10 volts

18840
2000
220840
104 ohms

48 C 12 ohms.

2.1139434
2.0170333
7.9355410
2.0665177 = 116
104
12

No a treated with ashes
ag plated

114.75 volts

18840
42000
23640
118 ohms

15 ohms

48 C

133
118
15

2.11394432
2.07188520
7.93930022

2.12512274

No B treated with ashes
ag plated

122.85 volts

18840
5200
24140
120 ohms

6 ohms

48 C

2.11394432
2.07988112
7.91009449

2.10321993

126
120
6

a treated with ashes
Ag plated No C.

114.07 volts
18840
3000
2/21840
109 ohms

15 ohms

124
4
15

48 C

2.1139434
2.0374267
7.9430951
2.0944652

treated with ashes
Ag plated No D.

114.75 volts
18840
3500
2/22340
111. ohms

14 ohms,

48 C

2 1139434
2 0453230
7 9393022
2.9985686

125
111
14

a breaker with ashes
Carbon p Calcad 995 volts
No 8

112.72 volts
18840
1900
2/20740
108 ohms
15 ohms

48 ©

2.11394 34
2.10128 372
7.94692 16
2.07370 22

118
3
15

a breaker with ashes
Silver plated
No 9

116.100 volts
18840.
4500
2/23340
116 ohms
14 ohms

48 ©

2.11394 34
2.06445 50
7.93554 10
2.11394 24

1301
116
14

Treated with ashes.
Silver plated

No 2

120.15 volts

18440
4600
2/23440
117 ohms

48 C

9 ohms

2.11394434
2.06818859
7.19208188
2.10294481

126
17
9

Treated with ashes 63

102058 volts

No 3 Ag. plated

120.15 volts

18840.
4600
2/23440
117 ohms

9 ohms

48 C

2.11394434
2.06818859
7

0

a treated with ashes
101 volts Cu plated —
no 4

117.45 volts

18840
4500 12 ohms
123340 116. ohms
48 C

2.1139434 128
2.0644580 16
7.9318141 12
21.102155

a treated with ashes
96.5 volts Ag plated
no 1

111.34 volts
18840. 18 ohms.
2700
~~5440~~ 21540
48 C 107 ohms

2.1139434 125
2.0293838 07
7.9546760 18
2.0980032

104 treated with Acid
Cy plated
no 17

123.52 volts
18840
4500

48 C

120.15 | 90 ohms

18840
4500
2.23340

125
116
9

116 ohms
2.1139434
2 0644580
7 9208188
10992202

102. treated with acid
no 20 Copper plated

118.12 volts
18840
3000
2.21840
109 ohms
48 C

11 ohms

2.1139434
2 0374265
7 9281180

120.
109
11

2.0794879

73 Carbon treated Carbotized
R190 1/2 size
no 1

66.15 volts
6279
6700
2/12979
641 ohms
24 C

Poor treated with acids
10 Cu plates

69

107.82 volts
18840
3200

the carbon slipped out of these clamps

48 C

114.07 volts 15 ohms

2.1139434
2.0294838
7.19430950
18840
2600
2/21440 2.0874222
1070 ohms
46

122
7
15

treated with acids

1012
2014 Copper plated

~~103.95 Volts~~

~~18840.~~
~~3200~~

48 C

114.07 volts 14 ohms

18840.
2300

2)21140
105 ohms

48 C 2.113934 34
2.021189 3
7.194309 50

0 119
14

2.078222 7

13
105

Treated with acids
Ag. plated

123.52

18840.
4900

~~123740~~
118 ohms

48 C 5, ohms

2.113934 34
2.071888 20
7.190657 83

1.092403 7

123
18
105

No 8. Treated with acid
Cu plated

121.50 Volts

18840. 7 ohms
4700

2)23540
117 ohms
48

2 . 1139434
2 . 0681859
7 . 9136402

2 . 0957695

124
17

7

No 7 Treated with acid
Copper plated shanks

114.75 Volts

18840.
3300

2)22140
110 ohms
48 R. 14 ohms

2 . 1139434
2 . 0413927
7 . 9393022

2 . 0946383

124
10
14

10415V Treated with acids

11. Ag. plated

122.85 volts

185.40

5200.

254040 6 ohms

120 ohms

48 C

2 113 94.34

2 079 18 12

7 910 09 49

2.1032195

126

Treated with acids

No 6 Agplated

10415

119.47 V

185.40. 11 ohms

4700

24540

122 ohms

48 C.

2. 113 943.4

2. 086.399 8

7. 924 452 0

2.1247952

133
22
11

Treated with acids.

Mg Copper plated

116.77 volts

188.40
35 00

12 ohms

2/22340
112 ohms

45 C

2. 1139434
2. 0492180
7. 9318141

2.0959755

12½
12

10* Treated with acid
10½ Ag plated

1#

120.15 volts

188.40
57 00

10 ohms

2/245540
122 ohms

45 C

2. 1139434
2. 0863598
7. 9208185

2.1121120

132
22
10

78

No I Treated with acid
10 US Ag. plated,

118.12 volts

18840.
4200
2/23140 110 ohms
115 ohms

48 C

2. 1139434
2. 0606978
7. 9281170

2.1027582 126
115
11

No 8 Treated with Carbolic Acid
190 R 1/2 size.

62.10 volts

6279
5000
2/11279
56 ohms

24 C

~~2. 1139434~~
2.
7.

2016 Treated with acid
1050 Cupplated

118.12 volts

18840 11 ohms
4700
423540 117 ohms

48 C

2 11394 34
2 06818 59
7 92811 70
21102463 12 8
17
11

106 Treated with acid
1270 Ag. plated

118.12 volts

18840 11 ohms
4700
423540
117 ohms

48

2 11394 34
2 06818 59
7

Treated with acids

10115
90

aq. plates.

116.10 volts

18840
3000
421840
109 ohms

13 ohms

48 C

122
109
13

2,1139434
2,0374265
7,9355410
2,0869109

Camp Cycle 24

12. 2591

93.15 Volts

12500
1400
139 00
69 ohms

28 1.3031 ✓

119.470

18840
3400

22240 111 ohms

48 ℄

1.0 ohms in coil

2.0755470
2.0755470
1.6464037
7.9546760

3.752237 5652 ft

119:130 :: 111

130
3330
111
119) 14430 (121
119
253
238
150

order 12 268
21

117.45 volts

18840
5500

~~24340~~ 121 ohms

48 ℄

117:130 :: 121

2.113 9434
2.1082 7854
7.9318141

2.128 5429

134
121
13

13 ohms to be inserted

8 Clamp marked

263

121.50 volts

18840
5000
23840 = 119 ohm

48

76 be marked

2.1139434
2 0755470
7 9136402
2.1031306

126
19
7

8 order 28

275

or 28

119.47 Volts

18840
5000
24640 = 123 ohms

48 C

11 ohms

2 1139434
2 0899051
7 9245220
2.1128005

134
33
11

order 29 ✓ 12. / 230

116.77 v

18840
3100
21940 = 109 ohms

48 l ~~10~~

120
9
11

2 1139434
2 0344265
7 9318140
2.2802839

order 29 ✓ 12 / 246

116.10 v

18840
3000
2 / 22673 113 - ohms

48 13 ohms used.

2.1139434
2.0530784
7 9.8 5 5 4 1 0
2.1025628

126
113
13

25 order ✓

9
264

114.07 ✓

18840
16000

2) 20440 (102 ohm
48

14 ohm insert

2.113 9434
2.008 6002
7943 0951

2.065 6387

116
02
14

order 26 7
208 ✓

110.02 ✓

18840
800

2) 196 40 (98.
48e

17 ohm insert

2,113 9434
1,991 2261
7.958 6073

2,063 7768

115
98
17

205 order
26

18840
1.200

2) 20 040 /100.

48 ℓ

No 28 Chloride Ammoni 5652 foot lbs –
21 Painted with Carbl Carbon – 117.½ volts 121 ohm
8 Piece Sodium, Res 119 – volts 121.50

lamp order

24 | 12
259

118.12 v

100 ohms mean

18840
1300
20140 = 100 ohms

48

2.1139434
2.
7.9281170
2.0420604

25 order

10
251

114.75 v

2)18840
94 ohms

48 @

12 ohms mean

2.1139431
1.9781279
7.9393022
2.0263732

106
94
12

58. 5/299

125.555

18840
7200
26040 = 130 ohms

48e 4 ohms insert

2.113.9434
2.113.9434
7.8796295
2.12751.63 134

22 12/227

111.34 volts

18840
1000
19840 = 99 ohms

48e 17 ohms insert.

2.113.9434
2.1995.6352
2.954.6760
2.06445.46

116
99
17

71 v

11/299

114.75 v

18840
3100
21940 = 109 ohms

48 e 14 ohms insert

2.113 9434
2.037 4265
7 939 3022
2.090 6721

123
109
14

74 6/283

122.17 v

18840
4500
23340 = 116 ohms

7 ohms insert

2 113 9434
2 064 4580
7 913 6402
2.092 0416

123
116
87

48 e

53 · 10/250

115.430

18840
2800
21640 = 108 ohms

48 ohms
14 insert

2.1139434
2.0334238
7.9393022
2.0868694

122
108
14 ohms

24 65

116.77 ℧

18840
800
19640 = 98 ohms

48

10 ohms

2.1139434
2.9912261
7.9318141
2.0369836

108
48
10

75 $\frac{10}{228}$

118612 volts

18840
2400
21240 = 106 ohms

48 @ 10 ohms insert

2.11394434
2.02530054
7.92811170
2.06736558

$\frac{166}{10}$

50 volts 9 249

120182 volts

18840
4500
23340 = 116 ohms

48 @ 8 ohms insert

2.11394434
2.06445580
7.91721460
2.09561160

$\frac{124}{116}$
8

49 ~~215~~ 10 250 90²

118.12 volts

18840.
3000

21840 = 109 ohms

48 @ 11 ohms unsatisfactory

2.1139434
2.0374265
7.9281170

210794869 120
09
11

67 10 250

121.50 volts

18840
4800

23640 = 118 ohms

48 @ 7 ohms unsatisfactory

2.1139434
2.0718820
7.9136402

2.1099465 6
110
175
8
7

Ex 49 v 10/270

118.8 volts

18840
4100
22940 114 ohms

48c 10 ohms insert

2.1139434
2.0569049
7.9244520
2.0953003 124
14
10

7/270 70

118.80 volts

18840
2700
21540 = 107 ohms

10 ohms insert

48c

2.1139434
2.0293838
7.9281170
2.0714442 117
10

73 $\frac{8}{257}$

119.47 Volts

18840.
6000
24840

11 ohms insert

124 Res

48 C

2.11394434
2.09342217
7.92445520

2.13181711

119 135
134
11

2.07554701
2.07554701
1.64640037
7.90657183

3.7040760 5059.
6
30384

21 ✓ $\frac{12}{223}$

113.40 R Volts

18840
1500

20340 = 101 Res.

15 ohms insert

48 C

2.113943 34
2.100432 14
7.946921 6

2.106518 64 116

12769
441

9076
5076
4000
3500
500
63

101

order 55 $\frac{9}{272}$

115.430 volts

18840
3500
22340 = 111 ohms

48C

14 ohms insert

2.11394434
2.10453230
7.93930022
20.98856686

125
111
14

order 25 $\frac{10}{288}$

108. volts

12560
5000
17560 = 87 ohms

48C

17 ohms insert

2.11394434
11.93951193
7.96657762
2.02003389

107
87
17

order 26 $\frac{''}{205}$

111.34 volts

12560
7100
19660 = 98 ohms

48 C 16 ohms insert.

2.1139434
1.9912261
7.9546760
2.0598455 114
                 98
                 16

order 69 $\frac{10}{242}$

This one with a very faint current was red at the top ~~to~~ while the rest was black

116.10 volts 13 ohms insert

18840
3100
21940 = 109 ohms
48 C

2.1139434
2.0374265
7.9355410
2.0869109 122
                 109
                 13

Ex 63 $\frac{9}{291}$

124.83 volts

18840
7100

25940 = 129 ohms

48 ℄ 5 ohm insert

Chemical Balance

2.1139434
2.1105597
7.9030890

2.1276221

134
29
5

Ex 51 $\frac{8}{263}$

118.80 volts

18840
4500

23340 = 116 ohms

10 ohm insert

48

2.1139434
2.0644580
7.9244520

2.1028534

126
16

10

289 CCl_3

101.25 volts

12560
5900

18460 = 920 ohms

48 C 26 ohms mean

2.1139434
1.9637878
7.9956788

2.0744098

118
92
26

or 60 10 244

118.12 VOLTS

18840
3100

21940 = 109 ohms

48 C 11 ohms mean

2.1139434
2.0374265
7.9281170

2.0794869

120
11

66 " 304

18840 113.40 volts
8700

22540 = 112 ohms

48 C 16 ohms insert

2.1139434
2.1049210
7.9469216

2.1100830 128
112
0
16

31 # 12
220

107.32 volts

18840
7000

19540 = 97.ohms
20 ohms insert

48 C

2.1139434
1.9867717
7.9706162

2.0713313 117
97
20

Order 23

114.07 volts

18840
3000
21840 = 109 ohms

48c 15 ohms current

2 113.9434
2 03742.65
7 9430957
2.09446550 124
9
16

3.1 12
248

122.85 V

18840
5000
23840 = 119 ohms 6 ohms resistance

2 . 113.9434
2 . 0755470
7 . 9100949
48c 2.09958553

125
19
6

order # 12
27 239

114.75 volts

18840
3500

22340 = 111 ohms

48 c. 14 ohms inserted

2.1139434
2.0453230
7.9393022

2.0985686 125
11
14

ordered 27 # 12
232

113.40 volts

18840
1800

20640 = 103 ohms

48 15 ohms inserted

2.1139434
2.0125372
7.9469216

2.0737022

118
103
15

52 X

This lamp worn up in Phone room.

or 30 14
241

~~[illegible]~~ 118.805

18840
4000
22840 = 114 ohm.

48 10 ohms inserted

2.11394434
2.05690449
7.92445520
2.09530003 124
14
10

9/255 14/239 or 103

111.34 volts

18840
2300
21140 105 ohm

48 C 17 ohms measured

2.1113 9434
2.0211 8933
7.9546 7600
2.0896 8087 122/17

16C 3789 Hz

97.2 v
18840
2300
22140 = 110 ohms 8.7 H P

14/234 or 104

84.37 volts 37 ohms measured

12560
1300
13860 = 69. Rec

2.1139 4434
8.3884 91
8.0357 206

2.0285 8331 106/69 37

1.3

84
336
678
711 6
7 2
4
2846
28464
31 31
276
37 5
34 5
26

69 | 31 31 (4530

31 7 8
31 7 8

14

259

104.

3,03 Volts

12560

~~1000~~

~~26000~~

37 ohms measured

13360 = 66 ohms

4 × C

211394 34

119543 9

080.921 9

20144092

103
66
37

69.36 V

12560
1000

13560 = 61.0

16

V 69 ohms 67

10.6

69
69
621
414
476
44
19044
19044
2094 84
201
840
67
178
144
44

3126 | 33.000

3126
11
3126
3126

3126
10
3126
174

67 | 3126

12 or

268 72.

108.00 volts

18840
7400
26240 = 131 ohms

48 Candle 26 ohm inserted

2 113 943 4
2 117 271 3
7 965 576 2
2.197 8809 157
131
26

or 289
68

120.15 volts

18840
3500
22340 = 111 ohms

48 C 12 ohms inserted

2.113943 4
2.045832 0
7920818 2
2.0800846 123
12 ohms

or 9
~~88~~ 295

8 or
265 76

93,825

12560
2800

15360 = 76 ohms

Blue at Camp

48 @ 29 ohms used.

2,113 9434
7,880 8136
8,026 8721

2,021 6291

105
76
29

12

or 30 244

124.2 v

1840 v
4000

22840 = 114 ohms

48 C 50 ohms insert

2.1139434
2.0569049
7.9065783

2.0774266

119
05

or 77 9
245

127.57 v

1840 v
4700

23540 = 117 ohms

48 C 2 ohms insert

2.1139434
2.0681859
7.8961963

2.1078325 6

119
17
2

86 11
278

143,15

Blue around the Camp

8
233 79

114,075
18840
23000

21140 = 105 ohms
48 C
14 ohms insert

2,113943 4
2,021 1893
7,943095 1

8078 2278

119
14

10 84

267

120.825

1884 0
5600

2440 = 122 ohms

4 8 e 9 ohms insert

2.11394934
2.08635598
7.91721.45

2.11785177

137
22

09

12# order
245 22

116.75

1884 0
2000

2164 0 = 109 ohms

48 e 11 ohms insert

2.11394934
2.03742655
7.92811.70

2.07948669

120
9

11

or 80 270

117.45 U

18840
21000

20940 = 100 ohms

48 C 11 ohms insert

2.11394434
2.0128372
7.93181141

2.0585947

164
33
11

or 85 9
295

127.57.U

18840
7400

26240 = 131 ohms

48 3 ohms insert.

127.130.131

2.11394434
2.1177213
7.896 1963

2.1274110

134
31
3.

p137 Platinized drops

141.75 U
25127
7000

48 C

at 1300 = 25 C

25127
2000
25927
129.

25027
126

15840
8800
24540 = 122 b

January

Order No 6. 5 mg naphthalene crystals dissolved in gasoline

Rinsed around!

((8) (No 2.)) (18 334) (1090 / 28)

130 volts

18840
9000 Res
200

48 C

OK

Platinized loops 1/5/81

P137 loop Soldered in Pt el.

$96\frac{1}{2}$

112.72 volts

18840
1600 R
20440 = 104 Res

48

113 : 130 :: 102 15 ohms

2.1139434
2.0086002
7.9469216
2.0694652

117
102
15

(Thus. 2.138 heavit. quick) (11 / 261)

100½v 4

118.8 volts

18840
6000
24440 = 122 ohms

48 Candles 110 ohms

119 : 130 :: 122

2.1139434
2.0863598
7.1244520
2.1247552

133
122
11

(125/81) (116/20 106)

128.125 volts

18840
6000
24840 = 124 ohms

48 C 2 ohms

128 : 130 :: 124

2.1139434
2.0934217
7.1892789 0
2.1071541

126
24

$\frac{1}{209}$ 1/25/81

(no 16)

124.83 volts

$\left.\begin{array}{r}1540\\8100\end{array}\right\}$ Res

21940 = 104 ohm

40 ohms

2.1139434
2.0170333
7.9030890

2.0340657

108

order no 13

22 high

64.13 V

40 ohms

$\left.\begin{array}{r}6279\\1600\end{array}\right)$ Res.

7879 = 39.

64.130.39

$\begin{array}{r}79\\39\\\hline 40\end{array}$

2.1139434
4.5910646
8.1938190

1.8988270

* (Large fall tube on pump, Heated quick 2 hours)

37 Candles at 130 volts

N. G

(Large fall tube on pump 13/232 heated quick 2 hours.)

116.10 volts

18640
3200 | R.
22040 = 110 ohms

116 : 130 :: 110 13 ohms

2.139434
2.041327
7.9558410
2.09087.71

123
10
13

Hundred quick 15
2 hrs 263

119.47 volts

10 ohms

18840 | R
32000
230 40 110 ohms
48 C

119 :: 130 :: 110

2.11394 34
2.041 39 27
7.924 45 20
2.079 78 81

120
10

order no 15 15
970 283

118.12 volts

18840 | R
24000
21240 = 106 ohms
48 C 10 ohms

118 :: 130 :: 106

2.11394 34
2.025 30 59
7.928 11 70
2.067 36 63

116
06
10

order No 14 No 4

NH in C. 1020

12

120.15 volts

18540
4400 | R

23240 = 116 ohms

48 C 9 ohms

120 : 130 :: 116

2.1139434
2.0644580
7.9208188

2.0992202

125
10
9

Quick heater 15
2 hrs 40 250

17 122.85 volts

4900
18540 R

23740 = 118 ohm

48 C 6 ohms

123 : 130 :: 118

2 : 1139434
2 : 0718820
7 : 9100949

2.0959203

127
6

Heating quick

101 v 2.156

(14)

122.85 volts

5500
18840 | R

24340 = 121 ohms

48 C 6 ohms

123 : 130 : 121

2.1139434
2.0827854
7.9100949

2.1068237

127
21
6

Heating Quick 2.156

15
294 103½ 19

~~122.85 volts~~

18840
7600

26440 = 132 ohms

48 C 7 ohms

123 : 130 : 132

2.1139434
2.1205739
7.9100949

2.1446122

139
32
7

Resistance quick 16
2.38 hrs. 248
102½ v 6

120.82 volts

8 ohms

18840 } Res 121:130 :: 113
~~3500~~
~~20~~
22140 = 113 ohms
45 C

121:130 :: 113

~~130 : 121 :: 113~~

~~2.1139434~~
~~2.0530784~~

3.7
quick heat 16
243
116 v
3.0

130.2 volts marks of 30 C

2.1139434
2.0530784
7.9172146
2.0842364

~~2.1139434~~
~~2.0530784~~
~~7.9172146~~
~~2.0842364~~

~~121~~

121
13
8

Heated Quick

3.34 5 / 355

101½ 17

124.83 volts

18840 / 48000 } Re 118 ohm

23640 = 118 ohms

48 C 4 ohms

125 : 130 : 118

2.1139434 122 / 18

2.0718820

7.9030890 4

2.0889144

heated quick

99½ 18 3.34 5 / 349

~~122.17 volts~~

121.50 volts 7 ohms

18840 / 45000 } Res, = ~~[illegible]~~

23340 = 116 oh

122 : 130 : 116

2.1139434 123 / 16

2.0644580

7.9136402 7

2.0920416

heated quick 99
hrs 3.34 $\frac{11}{365}$ 1

$103\frac{1}{2}$ 18 $\frac{13}{257}$
quick heated 2.40
124.92 v
123 R
2 ohm cent

quick Lime 3.19
13 263 .105

128.925
127 R.
2 ohms used

Quick Lime
3.19 . 16 235 .980
6

122.170
107 Ro
7 ohms used

quiete Rodeni 16
319 2.87

1105 21

128.25 vol.
118 ohms R.
2 ohms invert

quiet burlie
16 257 100½ 2

122.17 volts
119 R
8 ohms invert

Longest Quick
$98\frac{1}{2}$ bus 3.34 11
17 310

121,500
113 R
8 ohms insert.

Quick hunter
2.43. $\frac{13}{241}$ 119 8

33 Bullets at 1200

W.J.

heated quick
98.3 2.38

120.15 v
113 R
10 ohms insert

heated quick
2.56 * 6 261

122.85 v
118 ohms R
7 ohms insert

Lower quick

$\frac{15}{226}$ 238 . $\frac{101}{2}$

121.50 V

110 R

7 ohms insert

quick heater

3.7 96 V 24

121.5 V

104 R

7 ohms insert

quick heated

2.38 15/224 99 V 1.

121.5 V

112 R

8 ohms wire

" heated quick

.365 hro 3.34 99/1

120.82 volts

117 ohms R.

9 ~~11~~ ohms wire

Leaded quick

13

223 2.56

102½ 7

122.85 v

10. T. R.

6 ohms insul.

Leaded quick

2.38 94½ 10

15

225

118.80 v

109 R.

10 ohms insul.

January 29 1881

Lot of 21 a order 46

285 102 v.
1 v.

129.60 v
66000
18840 | R

48 C

Carnelia of Potash

Order 46 R 20 v.

107½ 26

130.27 v.
18600
18840 | R

48 C

order 46 R 283

Pump with Caustic Potash
in 'd 27 order 46
28.3 105 V.

129.60 V

OK

7600 | R
18840

26440 = 1
R 45 C

Order 46 R 283

105 V
14

128.25 ✓

18840
8200 | R

27040 135 ohms
2 ohms wt

2,113 9434
2,113 0388
7,892 7890

2,137 0762

137

Order 46 R 334

10 ½ V 8

131.63 V

9900
18840 | R

48 C

Order 46 R 289.

10 V

9

131.63 V

~~8400~~
18840 | R

OK

order 46 R 3 2

110 V

6

134.32 V

25127
3900 | R

order 46 104 V

R 3 25 1

129160 V

25127
3900 | R OK.

28027 = 140 R

Order 46 10.85 V
R 299 10

131.63 V

17000
25127 | R
26827 = 134 ohms

2.11394.34
2.11271048

975 19
20 Rx 116.15

cu deposite

120.15 V

9 ohms unset

4400
18840 | R
23240 = 116 ohms

2.113.94 34
2.064 45 80
7.920 81 88
2.099 22.02

125
10
9

1015 20 1/27/8/, 20 #
Cu deposit, 20 #

120.15 V

3700 | R
18840
22540 - 112 ohms

48 C 9 ohms insert

2.11394 34
2.049221 80
7.920881 44
21.083980 2

121
12
09

1065 V
2.7 20
Cu deposition

126.22 V

5900 | R
18840
24740 = 123 ohms

48 C 4 ohms.

121½ V

15 ar deport.

119.47 V

17000
8840 | R

20540 = 102 ohms

2.113 9434
2.008 6002
7192 4520

2.046 9956 9 ohms insert

94½ V
21

109.35 volts

12560
6100 | R

18660 = 93 ohms

17 ohms insert

Order 158 98½
No 16 (B)

No 16 (a)
108½ u

130 Volts
130 Ohms
0 Coil
48 Candles

E 158.

185 def. = 124.83 v

18840
4100
22940

*5 ohms unit

1140 ohms

48

125 : 130 : 114

2,11394434
2,05690449
79030890
2,07393373

114
5

C. 158

175 def. = 118.12 v

350
116.6

18840
4600
23440

2

117 ohms

*12 ohms

118 : 130 : 117

2,11394434
2,06818559
79281170
2,01102463

129
17
12

a

or 185.

127.57 volts

189 def

18840

4600

2(23440 * 2 ohms

117 ohm

128 : 130 : 117

2.113943 4

2.068185 9

7.892789 0

2.074918 3

118

16(b). 98.5 or 158.

175 def

118.125

18840

8000

2(19640

98 ohms * 10 ohms

118 : 130 : 98

2.113943 4

1.991226 1

7.928117 0

2.033286 5

108

98

10

158.

180 Def. 121.55

18840
3700 | Def. Res

2 | 24540
122 ohms * 9 ohms

2.1139434
2.0863598
7.9136402
2.1139434

130

NoB. 158

119.3

179 Def = 120.825

18840
2900

2 | 21740
108. R

8 ohms west

121 : 130 :: 108

2.1139434
2.0834238
7.9172146
2.0645818

116
08
8.

Order 132 R 220
Feb 2 1881 5

118.12 5

18540 | R
400
19240 = 96 ohms

48 C 9 ohms wasted

118 : 130 :: 96

2.113943 4
1.982271 2
7.921170
2.024331 6

105
44
9

Feb. 2, 1881.
Order 132 R 210
15

18540 | R
1400
20240 101 ohms
48 C

15 ohms waste

112.72 5

2.113943 4
2.004321 4
7.194692 16
2.106518 64

116
101

Feb. 2, 1881.
Order 132 R 220
20

117.450

18840
34000 | R
22240 111 ohms.
48
12 ohms inserted

2.11394 34
2.04532 30
7.93181 41 123
11
2.09108 05 12

Feb. 2, 1881.
Order 132 R 245
24 (B)

~~12~~ 5
112105 5 16 ohms inserted

18840
16000 | R
20440 = 102 ohms
48

2.11394 34 118
2.00860 02 02
7.95078 10 16
2.07432 46

Feb. 2, 1881.
Order 132, R 270
12

121.50 V

18840
3600 | R 7 ohms insert

22440 = 112 ohms

48 C 119
12
7

2.113944 34
2.049218 80
7.913640 2

2.077801 6

Feb. 2, 1881.
Order 132, R 248
25

118.12 V

18840
2700 | R

21540 = 107 ohms

48 C 11 ohms insert

2.118944 34
2.029388 8
7.928117 0

2.071442 2

118
12
81

Feb. 2, 1881.
Order 132, R 255
17

121.505 7 ohms insert

18840 | R
25000
21640 = 108 ohms

48 C 115
8

2.1139437
2.0334228
7.9136402

2.0610074

Feb. 2, 1881.
Order 132, R 230
19

116.775

18840 | R
25000
21340 = 106 ohms

48 C 12 ohms insert

2 1139434 115
2.0253059 106
7.9318141 12

2.0710634

Feb. 2, 1881.
Order 132 Hoe

120.75 ✓

18840 | R
42000
23040 = 115 ohms

48 C

9 ohms insert.

2.1139434 124
2.0606978 15
7.9208188 9

210954600

Feb. 2, 1881.
Order 132, R208.
102 Ω - 20

113.40 ✓

18840 | R
11100
19940 | = .99 ohms

48 C

15 ohm insert

2.1139434 114
1.9956352 99
7.9469215 15

2.0565001

Feb. 2, 1881.
Order 132, (No tag)
105½ V 24 (A)

~~188 40 V~~
~~15~~

1 116.775

188 40 | R
21 00
20940 = 104 ohms

11 ohms insert

648

11.5
08
19

2 113 94 34
2 017 08 23
7 931 81 49
2 062 79 04

Feb. 2, 1881.
Order 132, R 270
100½ — 4

114.75 V

188 40 | R
48 00
236 40 = 118 ohms

48

15 ohms insert

2 113 94 34
2 071 88 20
7 939 30 22
2 125 7276

13.3
18
15

Feb. 2, 1881.
Order 132, R20
16

~~112.72 v~~

112.72 v

15 ohms inst

18840 | R
1500

20340 = 101 ohms

48 C

2.1139434
2.00432214
7.94692216

2.06518864

116

Feb. 2, 1881.
Order 158 — U

121.50 v

18840 | R
6400

25640 = 128 ohms

48 C

8 ohms inst

2.1139434
2.10721000
7.91364002

2.10479361 36/8

Feb. 2, 1881.
Order 138-R 300
26

121.505

18840
6800
25640 = 125 ohm

48 C 8 ohms insert

Feb. 2, 1881.
Order 158-R 158
9

118.125

18840
4000
22840 = 114 ohm

48 C 11 ohms insert

2.113.943.4
2.056.904.9
7.928117.0
2.098165.3

125
14
11

Feb. 2, 1881.
Order 158 - ~~W~~

116.10 V

18840
4000

22840 = 114 ohms

48 C 13 ohms inert

2 113 94 34
2 05 69 49
7 92 55 41 0

2.106 38 73

127
14
13

Feb. 2, 1881.
Order 158 U *

121.50 V

18840
7000 | R

25840 = 129 ohms

48 C 8 ohms inert

2.113 94 34
2.110 58 97
7.913 64 02

2.138.17 33

137
29
8

Feb. 2, 1881.
Order 158. Y

121.505 V

18840
7300 | R
26140 = 130 ohms

8 ohms wire

48 C

122.130 :: 130 : 138

2 113943.4
2 113943.4
7 913.6402
2 141527.0

Feb. 2, 1881.
Order Z 158
Twice ~~[illegible]~~

124.83 V

18840
6600 | R
25440 = 127 ohms

48 C 5 ohm wire

125 : 130 :: 127
127
910
260
130
125/16510/1

2 113943.4
2 10350.37
7 90.30890
2 112083.61

132
127
5

Feb. 2, 1881.
X
Order 158

121,500

18840 | R Tolins in wt
2700

21540 = 107 ohms 0.

122 : 130 : 107 :: ~~[illegible]~~ X

130
107
910
130
122 / 13910 / 114
122 / 107
171 / 7
122
490
488
2

Feb. 2, 1881.
Marked
H. J. N.

101,250

12560 | R
1100

13660 = 68. ohms

48 C

101

Feb. 2, 1881.
Tag – 1/27/81 – #21
PK 1. p. 15 (20)
J. W. L.

E. ~~M.~~ 7, 130 V – OK.

126.9 V

20 ohms Ω

18840
6100

24940 | 124 ohms obs

127 | 124
130
3720
124
127 | 16120 / 126
127
342
254
880
762
118

126
124
2

Feb. 2, 1881.
Order 117 – 101½ V.

124.83 V

18840
4600

23440 = 117 ohms

40 ohm mount

48 Ω

117
130
351
117
125 | 15210 / 121
125
271
250
210
125
85

121
117
4

Feb. 2nd 1881.

Order 117-101 V.

~~two half 2 coils~~ in one

coil 119.4 V

18840 11 ohms insert

5700

24540 = 122 ohms

48 C

```
      122
      130
     3660
     122
119 | 15860 | 133
      119
      396
      357
      390
      357
       33
```


Feb. 2, 1881.

Ot 9-99½ V

12

one with a Condenser

120.82 V

18840 | R 8 ohms insert

3500

22340 = 111 ohms

48 C

```
      111
      130
     333.0
     111.
121 | 14430 | 119
      121
      233
      121
      1120
      1089
        31
```

8

5762) 3 8
38000
3872 (6 +

517

127
127
869
254
127
16129
4403
48387
64516 = 2
64516

124) 714514 (5762
620
945
945
868
771 2
620
51
771
744
870

Feb. 3, 1881.
Order 44 - R 275
104 1/2 U - 5

130.27 V

1440
5200

24040 = 120 R.

OK

4¢

Feb. 3, 1881.
Order 44 - R 275
112 U - H

~~to~~ 130.27 V

25127
5200

30327 = 151 ohms

24 e at this.

Feb. 3, 1881.
Order HH-R 230
95V-1

116.77 V

18540
300

19140 = 95 ohms
10 ohms

48 C

10 ohms insert "

105
95
10

2.1139434
1.9777236
7.9318141

2.0234811

Feb. 3, 1881.
Order HH-R 245
95V-22

114.75 V

18840
600 | R

19440 = 97 ohms

48 C 12 ohms insert

1139434
986 7717
939 3022

0400173

109
97
12

Feb. 3, 1881.
Order 44 – R 285
107½ V – 10

130. V

25127
1500

26627 = 133 ohms

36 C

Feb. 3, 1881.
Order 44 – R 250
97 V – 17

118.12 V

18840
2000 R

20840 = 104 ohms

48 C 100 ohm used

113943.4
017.0333
9281170

.0590937

114
10

Feb. 3, 1881.
Order 44 — R 300
113½ V — 3A

130 V

25127
3000 R

28127 140 R

38 C

Feb. 3, 1881.
Order 44 — R 280
106 V — 27

130 V

18840
5200 R

24040 = 120 ohms

48 C

OK

Feb. 3, 1881.
Order 44 – R 280
111½ V – 6

130 V

25127 R
1300
26427 = 132 R

36 C

Feb. 3, 1881.
Order 44 – R 295
112 V – 13 B

130 V

25127 R
8200
28327 = 141 ohms

36 C

Feb. 3, 1881.
Order HH—R 270.
108 V—25

130 V
25127 R 1250 ohms

48 C

OK

Feb. 3, 1881.
Order HH—R 285
109 V—13

130 V
18840
6800
25640. = 128 R.

48 C

OK

Feb. 3, 1881.
Order HH – R 290
99 V – 11

124.83 V

18840
3500
22340 = 111 ohms

48 C

OK

Feb. 3, 1881.
Order HH – R 300
104 1/2 V – 25

130. V

18540
7100
25940 = 129 Ω

48 C

OK

Feb. 3, 1881.
Order 44 - R 310
113 V - 23

180 V

18840
9700 R

28540 = 142 ohms

48 C

OK

Feb. 3, 1881.
Order 105 - R 337
108 V - 15

130 V

18840
7300 R

26140 = 130 ohms

48 C

OK

Feb. 3, 1881.
Order 105 – R 278
111½ V – 13

130 V

18440
8800 R

27140 = 135 ohms

34 C

Feb. 3, 1881.
Order 120 – R 312
113½ V – 24

130 V

25127
4000

29127 = 145 ohms

~~16 C~~
32 C meters

Feb. 3, 1881.
Order 120 – R 480
Lot 8 – High 22

120 V
very high R.

Feb. 3, 1881
Order 131 – R 405
115 V – 17

120 V

25127
6100 R
31627 = 158 ohms

33 C

Feb. 3, 1881.
Order 131 – R 375
118 V – 15

130 V

25127
8200 R
33327 = 166 ohms

30 C

Feb. 3, 1881.
Order 137 – R 345
18

130 V

25127
5700 R
30827 = 154 ohms

34 C

Feb. 3, 1881.
Order 137 – R 340
30

found it bracket.

Feb. 3, 1881.
Order 137 – R 310
7

130 V

18540
3000 R

22840 = 111 ohms

30 C

Feb. 3, 1881.
Order 143-R #10
122 V-7

130 V
25127
7500 R
32627 = 1.63 ohms

22 C

Feb. 3, 1881.
Order 143-R #20
1

130 V
25127
6000 R
31927 = 1.59 ohms

48 C

OK

Feb. 3, 1881.
Order 143 (A)

130 V

25127
7300 R

32427 = 162 ohms

26 C

Feb. 3, 1881.
Order 143 (B)

~~130 V~~
~~25127~~

to high Res

Feb. 3, 1881.
Order 131 — R 185
123 V — 23

burned when got it,

Feb. 3, 1881
Order 131 — R 380
116½ V — 1

130 V
25127 V
9500 R
34627 = 173 ohms
48 C

Feb. 3, 1881.
Order 125 – R 360
118 V – 16

130 V

25127
6500 R

31627 = 158 ohms

81 C

Feb. 3, 1881.
Order 125 – R 355
119 V – 30

130 V

25127
6200 R

21327
22 C = 106 ohms

Feb. 3, 1881.
Order 125 – R 330
117½ V – 7

130 V
25127
3300 R
28427 = 142 ohms
29 C

Feb. 3, 1881.
Order 127 – R 410
121½ V – 6

130 V
25127
8300 R
33427 = 167 ohm
C 23

Feb. 3, 1881.
Order 126 — R 290
118½ V — 3

130 V
25127
4300 R
29427 = 147 ohms

24 e

Feb. 3, 1881.
Order 126 — R 290
103½ V — 22

~~130 V~~
~~25127~~
~~1300~~
121.5 V

Feb. 3, 1881.
Order 126 – R 256
99½ V – 2

119.47 V

25127
1000 R, 120 ohms insert

26127 = 130 ohms

48 C

113943 4
142 11394 34
383 92445 20
12

15233 88

Feb. 3, 1881.
Order 138 – R 290
13

120.525 V

18840
350 V R 8 ohms insert

22340 = 111 ohms

48

119
8

113943 4
04532 30
917214 6

2876481 0

Feb. 3, 1881.
Order 138 – R 315
.23

130 ✓

18840
590 ✓ 0
24740 = 123 ohms

48 C

OK

Feb. 3, 1881.
Order 129 – High 16

found the bustd

Feb. 3, 1881.
Order 129 - High 19

No vacuum. Wind up

Feb. 3, 1881.
Order 107 - R 429
121 V - H

130 V

25127
9800
34927 = 174 ohms

16 Candles.

Feb. 3, 1881.
Order 115 – R 365
120 V – 17

130 V

25127
9000
34927 = 174 ohms

19 C

Feb. 3, 1881.
Order 115 – R 340
116 V – 3

130 V

25127
7600
32727 = 163 ohms

25 C

Feb. 3, 1881.
Order 115 – R 334
112½ C – 9

130 V

25127
7300 R
32427 = 162 ohms

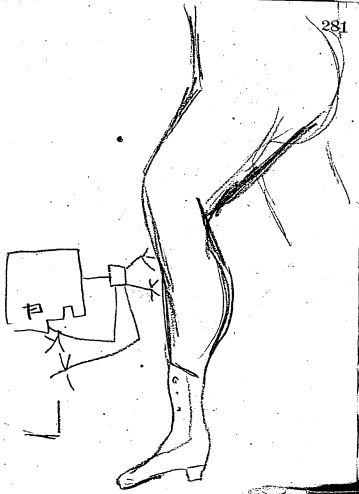
26 C.

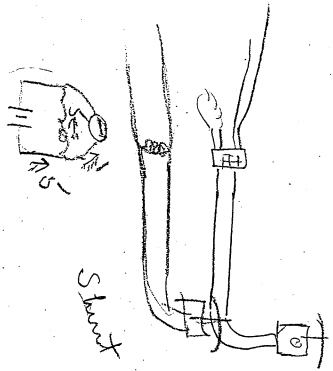
Feb. 3, 1881.
Order 115 – R 350
122½ C – 16

130 V

31406
5000 R
36406 = 182 ohms

16.05 C

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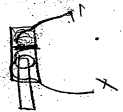

$\mathcal{E} = e = \frac{\mathcal{E}}{R}$

$eR = \mathcal{E}$

$R = \frac{\mathcal{E}}{e}$

1 W

3 e

$\mathcal{E}$

120

115

115

575

1725

5190

6910

6910

7644

7644

7200

441

3600

900

15

200)1000 (.00

200)1000.005

$\frac{11}{10}$ V

$\frac{1}{10000}$ R

6 W

500 ohm

104 . 130 53

2

2.1139484

1.7242754

7.9929667

1.8210870